PATENT
Docket No. GEM-400

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January 10, 2000
January 10, 2000

Sean Fitzgerald
Sean Fitzgerald

APPLICATION TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFCE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

Box PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Transmitted herewith for filing is the patent application under 35 U.S.C. 371 of Lionel JEAN and Jean-Claude, OUVRAY: A METHOD OF MANAGING A SECURE TERMINAL

Enclosed are:

☒ 15 Pages of specification.

☒ 3 Pages of claims.

☒ 1 Page of abstract.

☒ 2 Sheets of drawings.

☒ Preliminary Amendment

☒ Declaration of the inventors [unsigned].

☐ Power of Attorney and Prosecution by Assignee under 37 C.F.R. § 3.71.

☐ Assignment.

☐ Assignment Recordation Form.

☒ Other: postcard.

Applicant herewith submits to the Unites States Designated/Elected Office (DO/EO/US) the following items and other information:

- ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371
- ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than to delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1).
- ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
- ☒ A copy of the International Application as filed (35 U.S.C. 37(c)(2)) has been transmitted to the International Bureau.
- ☒ A translation of the international application into English (35 U.S.C. 37(c)(2)).

The filing fee has been calculated as follows:

FOR	NUMBER FILED	NUMBER EXTRA	RATE	CALCULATIONS
TOTAL CLAIMS	20 - 25 =	5	x $18.00	$90.00
INDEPENDENT CLAIMS	3 - 1 =	0	x $78.00	$0
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $260.00	$0
			BASIC FEE	$760.00
		TOTAL OF ABOVE CALCULATIONS =		$850.00
Reduction by 1/2 for filing by small entity (Note 37 C.F.R. §§ 1.9, 1.27, 1.28). If applicable, verified statement must be attached.				$0
Assignment Recording Fee (if enclosed)				$0
			TOTAL =	$850.00

☒ The Assistant Commissioner is hereby authorized to charge the filing fee of $ 850.00 any additional fees under 37 C.F.R. §§ 1.16 or 1.21 that may be required by this transmittal, or to credit any overpayment, to **<u>Deposit Account No. 501036</u>.** A duplicate copy of this transmittal is enclosed for that purpose.

Dated: 1/10/2000

Respectfully submitted,

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January 10, 2000
January 10, 2000

Sean Fitzgerald
Sean Fitzgerald

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

JEAN, Lionel and OUVRAY, Jean-Claude

Serial No.: 09/ ,

Filing Date: January 10, 2000

For: A METHOD OF MANAGING A SECURE TERMINAL

Examiner:

Group Art Unit:

PRELIMINARY AMENDMENT UNDER 37 C.F.R. §1.115

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Please amend the co-filed application, which is based on and claims priority to International Patent Application No. PCT/FR98/01464, filed on July 8, 1998, which is based on and claims priority to French Patent Application No. 97/08813, filed on July 10, 1997.

AMENDMENT

In the Specification:

Page 1, line 2, before "The object of the present invention...", insert on a separate line --This application is based on French Patent Application No. 97/08813, filed on July 10, 1997, which is incorporated by reference herein.-

Page 1, line 2, , before "The object of the present invention...", insert on a separate line -- **BACKGROUND**--.

Page 1, line 2, , before "The object of the present invention...", insert on a separate line --Field of the Invention--.

Page 1, line 20, before "A method of ...", insert on a separate line --Related Background--.

Page 3, line 6, before "In the invention ...", insert on a separate line **--SUMMARY**--.

Page 4, line 27, before "The Invention will...", insert on a separate line –Brief Description of the Figures--.

Page 5, line 13, before "Figure 1 shows...", insert on a separate line –**DETAILED DESCRIPTION**--.

In the Claims:

Please amend the following claims.

1. (Amended) A method of managing a secure [(7)] terminal [(1)] used for transactions with smart cards, comprising [having the following steps]:

- placing a smart [(22)] card [(5) is placed] in contact with the terminal,
- executing a program by the terminal [is made to execute a program (26)], this program including sensitive operations [(29)] related to making the transactions secure,

[characterised in that]

- counting the number of times a request is made to the terminal to execute sensitive operations [is counted (32, 16)], and
- restricting the action of this terminal [is restricted as soon as] when this count reaches [(33)] a [fixed] predetermined value.

2. (Amended) A method according to Claim 1, [characterised in that] further comprising

- providing the terminal [is provided] with a removable electronic security circuit [(8)], and
- counting in this circuit the number of requests for sensitive operations which are made to it or sensitive operations executed by it [are counted (16) in this circuit].

3. (Amended) A method according to [either of Claims 1 or 2, characterised in that] claim 1, further comprising

- dividing the sensitive operations [are divided] into a number of classes and
- establising a count [(16, 17) is set up] for each class.

4. (Amended) A method according to [one of Claims 1 to 3, characterised in that,] claim 1, further comprising:

- executing [as] a sensitive operation, a mutual identification procedure between the terminal and the card [is executed].

5. (Amended) A method according to [one of Claims 1 to 4, characterised in that,] claim 1, further comprising:

- as a sensitive operation, performing an authentication (PIN) of a carrier of the smart card [is performed].

6. (Amended) A method according to [one of Claims 1 to 5, characterised in that,] claim 1 further comprising:

- as a sensitive operation, performing a verification of a certificate coming from a smart card [is performed].

7. (Amended) A method according to [one of Claims 1 to 6, characterised in that] claim 1, wherein

- the counter is re-initialized by a secure procedure including a verification of a secret code by the terminal or the security circuit.

8. (Amended) A method according to Claim 7, [characterised in that] wherein

- the secure procedure includes a verification of a secret code by the terminal or the security circuit.

9. (Amended) A method according to Claim 7, [characterised in that] wherein

- the re-initialization is performed remotely by a master system.

10. (Amended) A method according to [one of Claims 1 to 9, characterised in that] claim 1, wherein

- the counter is incremented after a successful sensitive operation.

11. (Amended) A method according to [one of Claims 1 to 10, characterised in that] claim 1, wherein

- for restricting, only some [(47)] of the operations of the planned transaction are prevented.

12. (Amended) A security circuit for implementing the method according to [any one of Claims 1 to 11 characterised in that it has] claim 1, wherein the management means [(16, 17, 32, 39)] is capable of:

- identifying and counting requests coming from outside and restricting its functions as soon as the count reaches a predetermined number.

Please add the following claims:

13. A method according to claim 2, further comprising
- dividing the sensitive operations into a number of classes and
- establishing a count for each class.

14 A method according to claim 13, further comprising:
- executing a sensitive operation, a mutual identification procedure between the terminal and the card.

15. A method according to claim 14, further comprising:
- as a sensitive operation, performing an authentication (PIN) of a carrier of the smart card.

16. A method according to claim 13 further comprising:
- as a sensitive operation, performing a verification of a certificate coming from a smart card

17. A method according to claim 13, wherein
- the counter is re-initialized by a secure procedure including a verification of a secret code by the terminal or the security circuit.

18. A method according to Claim 17, wherein
- the secure procedure includes a verification of a secret code by the terminal or the security circuit.

19. A method according to Claim 17, wherein
- the re-initialization is performed remotely by a master system.

20. A method according to claim 13, wherein

- the counter is incremented after a successful sensitive operation.

21. A method according to claim 13, wherein
- for restricting, only some of the operations of the planned transaction are prevented.

23. A security circuit for implementing the method according to claim 13, wherein the management means is capable of:

- identifying and counting requests coming from outside and restricting its functions as soon as the count reaches a predetermined number.

24. A method according to claim 19, wherein
- the counter is incremented after a successful sensitive operation.

25. A method according to claim 19, wherein

- for restricting, only some of the operations of the planned transaction are prevented.

REMARKS

Claims 1-12 have been amended. New claims 13-25 have been added. Changes have been made the specification to insert the proper headings, without adding new matter.

Respectfully submitted,

Dated: January 10, 2000

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2/PRTS.

A METHOD OF MANAGING A SECURE TERMINAL

The object of the present invention is a method of managing a secure terminal also referred to as a reader, and a security circuit for implementing the method. It relates to the field of so-called smart microcircuit cards and more generally the field of portable smart objects. This field is the one by which, with electronic circuits, either carriers of smart cards are authenticated, or information contents contained by the memories of these cards are authenticated, or finally payments, or credit increases, are carried out by modifying a number stored in the card and representing payment units or loyalty points.

The object of the invention, in view of the very considerable development of transactions accessible with smart cards, is to make the read terminals, the available number of which is growing in parallel with the uses of smart cards, safer, to make them secure.

A method of managing transactions using smart cards is for example described in European patent application EP-A-91 400 201.9 filed on 29.01.1991.

The security systems in use at present have, in the readers, security circuits whose task is notably to control the execution of all these verification or authentication protocols executable by the reader. These security circuits, referred to as SAM (SECURE APPLICATION MICROMODULE) circuits, are generally removable and are connected to the reader in order on the one hand to provide this security operation control, and on the other hand to specify certain operations related to a particular application implemented by the reader. An application is a series of operations executed by a reader, or a device to which this reader is connected, and which leads to the satisfying of a requirement (in terms of goods or services) expressed by the carrier of the card. The removable nature of these security circuits makes them insecure as regards defrauders who are suspected of wishing to know the secret thereof. This will be even more achievable as the number of security circuits becomes large.

One aim of the invention is to guarantee that the terminals and the security modules are not used outside the application to which they are dedicated. This is because the illegal use of a security circuit, without a terminal, is critical from the security point of view since it is possible for a defrauder to have information on the secrets contained in the security circuit. The use of a terminal without its security circuit is generally of no interest since the terminal does not hold the secrets of the application. It is therefore not capable of doing much. The use of a terminal and its security circuit is furthermore in certain cases also critical. This is because the terminal plus security circuit assembly makes it possible to carry out complete operations on real cards. It is therefore essential to restrict the use of security circuits alone and security circuit plus terminal assemblies.

In the invention, in order to remedy the problems cited, counting the number of times the security circuit is used for so-called sensitive commands is recommended. Sensitive commands will be considered to be commands making it possible notably to give access rights, to authenticate, to guarantee confidentiality, to produce cryptograms, to verify certificates, etc. In general, it will be possible to consider any command as sensitive. In this case its existence will be accompanied by an attribute which gives it, or does not give it, this nature.

In the invention, when the count of the number of uses of the security circuit reaches a fixed value, the operation of this security circuit is inhibited. In this case, this security circuit can no longer perform its security work. Under these conditions, each time a request is made to it by the terminal, the transactions carried out by the terminal, and for which its operation is required, are inhibited. In an improvement, of course, the counter of this security circuit can be re-initialized by complying with a procedure which is itself secure.

The object of the invention is therefore a method of managing a secure terminal used for transactions with smart cards having the following steps:

- a smart card is placed in contact with the terminal,

- the terminal is made to execute a program, this program including sensitive actions related to making the transactions secure,

characterised in that

- the number of times a request is made to the terminal to execute sensitive operations is counted, and

- the action of this terminal is restricted as soon as this count reaches a fixed value.

In the meaning of the invention, there can be a request as soon as the terminal or the security module receives and identifies an instruction or a sensitive command. It is therefore possible to count the sensitive commands independently of their execution and/or the result of their execution.

An object of the invention is also a security circuit for implementing the above method. It is characterised in that it has management means capable of identifying and counting requests coming from outside and restricting its functions as soon as the count reaches a predetermined number. The requests can come either from the terminal, or from the master system, or from a terminal emulator which would be implemented by a defrauder.

The invention will be better understood from a reading of the following description and from an examination of the accompanying figures. These are given for information only and are in no way limitative of the invention. The figures show:

- Figure 1: a schematic representation of a terminal which can be used to implement the method of the invention;

- Figure 2: a flow diagram showing the main steps of the method of the invention;

- Figure 3: the architecture of the electronic means implemented in the terminal of Figure 1;

- Figure 4: an example of a sensitive security operation performed by the security circuit of the invention.

Figure 1 shows a terminal 1 which can be used to implement the method of the invention. The terminal 1 has, in a known manner, preferably, a keypad 2, a screen 3 and a slot 4 for inserting therein a smart card 5 to be read with the reader terminal 1. The terminal 1 can furthermore be connected with a master system 6. The connection can notably be of the telecommunication type, the master system 6 being remote. The telecommunications can for example be radio. The terminal 1 is however capable of performing a certain number of operations autonomously and it is these which are mainly concerned. In a particular example shown in Figure 1, the security circuit which is usable in the terminal 1 is removable: it is a circuit 7 set in a portable smart object 8. The portable smart object 8 can have the same form as a smart card 5. Preferably, it has a different form with notably a geometric polarization part 9 for preventing users from putting it in incorrectly. The object 8 is intended to be inserted in a read slot 10 of the terminal 1 intended to receive it and it alone.

Figure 3, shown below Figure 1, shows for the corresponding parts the architecture of the electronic system thus constituted. The circuit 7 thus has, preferably, a microprocessor 11 connected by an address, data and control bus 12, on the one hand with an input/output interface 13 represented by a connector. The microprocessor is on the other hand connected with a set of memories 14 and 15 and counters 16 and 17.

In the same way, the electronic system of the reader 1 has a microprocessor 18 connected with a bus 19, of the same type as the bus 12, with two input/output interfaces respectively 20 and 21 for communicating with the circuit 7 on the one hand, and with an electronic microcircuit 22 of the smart card 5 on the other hand. The bus 19 is also connected with the keypad 2 and the screen 3. The microprocessor 18 furthermore executes programs which are contained in a program memory 23.

The physical structures of the microprocessors, program memories, buses and interfaces can be various. Preferably, the memories are non-volatile type memories. The counters 16 and 17 are non-volatile counters. They can be implemented with an abacus method: each incrementing of the counter amounting to causing the change in state of one of the memory cells of a register, serving as an abacus, and acting as the counter. When all the memory cells have toggled, the counter has reached the fixed value. Preferably, nevertheless, the counter can be implemented in the form of a recording recorded in a data memory 50 associated with counting software of the circuit 7. The counting software consisting, at each increment, in reading the former value of the counter, incrementing its value by units, and writing the new value of the counter in the place of this recording. In this case, the fixed value is contained in the counting software. In addition, the keypad 2 and screen 3 are necessary only inasmuch as the application implemented by the terminal 1 requires the display and entry of information of the carrier of the card. In certain cases they can be omitted, the exchange protocol between the card 5 and the terminal 1 being automatic.

Figure 2 shows the main steps of the management method of the invention. During a step 24, an operator places a smart card 5 in contact with the terminal 1. The terminal 1, applying the instructions of its program 26 stored in the memory 23 and executed by the microprocessor 18, reacts to this insertion and makes a transaction request 25. This transaction request may be simply the configuration of the microprocessor 18 in order to make it available to the microprocessor 11. The transaction request can thus, for example in the case of verification of the carrier of a smart card, be the request for verification of the secret code of this carrier. In this case, the program 26 stored in the memory 23 has an instruction of the type: "Initiation of the operation of verification of the secret code of the holder by the security circuit 7". This transaction request sent by the microprocessor 18 to the microprocessor 11 may nevertheless be different and correspond to all the security operations mentioned above.

According to the invention, the security circuit 7 then performs the sequence of operations 27 of Figure 2. During a first operation 28 of this sequence 27, the microprocessor 11 of the circuit 7 checks whether or not an instruction 29 of its security program 30 loaded in memory 14 is a sensitive type instruction. It is of the sensitive type if it is assigned for example an attribute, a flag, which is associated with it for that purpose. Such a flag can for example be a particular bit configuration of the instruction code of the instruction 29.

If it is not a sensitive type instruction, if it is not of the type for which it is necessary to count the number of times it has been implemented, the remainder of the transaction is immediate. The circuit 7 and/or the reader 1 then continue, by means of the operation 31, to operate as in the prior art. On the other hand, if the requested operation relating to the instruction 29 is a sensitive operation, the microprocessor 11 inserts, in the flow of the program 30, a program 32 for managing the counter itself also stored in the memory 14. In the program 32 there is a first test 33 by means of which it is sought to ascertain whether a security counter, for example the counter 16, has a value less than a value fixed in advance. If this is the case, the securing operation 34, necessitated by the instruction 29, is executed. In a conventional manner, the program 30 includes a verification 35 that the operation 34 was successful. If, during the corresponding test 35, it is detected that the securing operation 34 was not successful, the circuit 7 delivers a rejection signal transmitted by means of the connector 13 to the interface 3. In this case the terminal 1 produces on the screen 3 a message indicating failure.

Making secure can for example concern verification that a secret code typed on the keypad 2 by a user corresponds to a secret code stored in the circuit 22 of the card 5.

On the other hand, if the operation 34 was successful, then there is decided upon, according to the invention, an operation 36 of increasing the content of the counter 16. After the incrementing 36 of the counter 16, the program 32 ends at the operation 31 as before.

In Figure 2, as regards the operations 28, 33 and 36, a duplication of these operations has been shown. This is to be related to the existence of another counter: counter 17. This is because, according to the invention, provision is made to classify the transaction requests, depending on their nature, into a number of classes. There can, for example, be the authentication class, the encryption class, the cryptogram decryption class (certificate reading) and so on. There are then created as many counters 16, 17 as there are classes managed by the tests 28. A different counter is preferably allocated to each class. Here, two classes corresponding to the counters 16 and 17 have been shown. In other words, the test 28 will seek to ascertain whether the requested transaction 25 is a transaction corresponding to an instruction 29 or whether it is furthermore a transaction corresponding to another instruction 37 of the program 30. The counter 16 counts the number of times the instruction 29 is used, and the counter 17 counts the number of times the instruction 37 is used. The class is differentiated in the attribute.

It has been preferred to increment the counter after verification 35 that the securing operation 34 had been successful so as not to unnecessarily count operations in the security circuit 7 installed in the reader 1 if an operator makes a mistake during the operation 34 while entering his code number with the keypad 2. The position of the operation 36 in the tree structure issuing from the operation 33 can nevertheless be any position, for example situated between the step 33 and the step 34. According to what has just been said, preferably it is situated at the end of this tree structure.

The values of the counters 16 or 17 are not less than the fixed value when, at a previous transaction, they have reached this fixed value. In this case, in an operation 38, corresponding to a subprogram 39 stored in the memory 15, the re-initialization of the counter 16 or 17 concerned is caused. This re-initialization operation is in no way different, in the invention, from the forms it can otherwise have in a known manner in the prior art. The subprogram 39 can have notably a secure procedure, in particular verifications of secret codes as will be explained below.

These programs 30, 32 and 39 may be included in a single main program. The representation thereof which is given here is indicated in order to show clearly the contribution of the invention. In the prior art, only the program 30 existed. In the invention there exist in addition the program 32 for implementing the new operations 33 and 36 and the program 39 for performing the operation 38.

By way of example, an authentication operation between a terminal 1 and a card 5 is shown in Figure 4. In this, the terminal 1 sends a random number, a string of characters, always different from one session to another, to the smart card 5. The card 5 receives, in its circuit 22, the value of this random number. The card 5 possesses means, notably in general a microprocessor of the same type as the microprocessors 11 and 18, and furthermore secret information, a secret code. The card microprocessor is capable of implementing an encryption algorithm for encrypting the random number as a function of the value of the secret code. This encryption results in an encrypted random number produced by the card. The card then transmits the encrypted random number from its connector to the interface 21 of the terminal 1. The terminal 1 is capable of performing an encryption of the random number (it knows it since it itself produced it) by a Personal Identification Number (PIN) typed on the keypad by the user. This last encryption results in an encrypted PIN. The terminal 1 then causes the comparison of the encrypted random number with the encrypted PIN. If the comparison is positive, the remainder of the transaction takes place, otherwise the terminal 1 causes the rejection thereof.

These operations shown thus under the reference 40 are typically sensitive operations performed by the security circuit 7 inside the terminal 1.

In a comparable manner, provision can be made that a combination of keys on the keypad 2 leads to an operation 38 of re-initialization of the counter or counters 16 or 17. This operation 38 will include, with this aim, a request, displayed on the screen 3 of the terminal 1, made to the operator to enter a secret re-initialization number. This secret number will not be a PIN number but something equivalent. Once this secret number has been entered and a validation key on the keypad 2 pressed, the circuit 7 will perform the comparison, direct in this case, of the secret number entered with an expected number stored in its memory 50. If the comparison is positive, the selected counter is re-initialized. It is available for the same number of transactions.

Preferably, the re-initialization is performed remotely by a master system, for example following an operation of collecting daily transaction data.

In order to prevent the defrauder using a reader 1 for attempting, fraudulently, to reactivate the circuit 7, provision can be made, in the operation 38, for another counter in the circuit 7, for example restricted to three operations, above which the circuit 7 will be permanently disabled if the secret number entered is false three times in succession. This counting up to three can be performed by the terminal 1 (in its program 26); it is preferably performed by the circuit 7 itself. In a variant, the circuit 7 can be used once only; as soon as the counter 16 or 17 is inhibited, it is necessary to replace it with a new circuit 7. If need be, a procedure of erasing the content of the SAM, in particular encryption algorithms and secrets, is automatically initiated.

By acting in this way it is realized that a defrauder will have only a limited number of accesses to the security circuit 7. Above this, the circuit 7 will disable all readers 1 into which it is inserted.

In an example, a sensitive action is therefore an authentication of a carrier of the smart card. In another example, a sensitive operation can quite simply be a cryptogram of certain data, or a mutual authentication procedure. Data are thus transmitted to the security circuit 7 which retrieves them in an encrypted form, usable with a view to their transmission, or their storage in the smart card 5. In the field of the electronic purse, provision is made for the smart card to have a state of the balance of the purse and a certificate. The certificate is a cryptogram representing the consistency of the balance of the purse with information relating to the card, for example its serial number, and variable information, for example an operation counter which counts the number of times the purse has been used. The cryptogram verification operation, a sensitive operation, performed by the secure circuit, consists in recalculating the certificate on these bases, and in verifying that the one recorded in the purse smart card is the same.

For restricting the operations, they can already be prevented completely. This is what has been seen so far. Nevertheless, and this is depicted schematically by the dashed link 41 in Figure 2, a degraded operation of the terminal 1 can be accepted. In this degraded operation, of course, no sensitive operation can be performed. On the other hand, harmless operations, display of the account balance, transmission of non-confidential information (serial number, bank account number, name and address of the carrier) can be allowed. In this case, the program 26 can continue to run in accordance with what was provided for by its designer. This is because the program 26 represents one part of the application and it is possible that certain actions can be executed even if in other respects it has not been possible to verify other sensitive operations. The other part of the application is contained in the program 30.

CLAIMS

1. A method of managing a secure (7) terminal (1) used for transactions with smart cards having the following steps:

- a smart (22) card (5) is placed in contact with the terminal,

- the terminal is made to execute a program (26), this program including sensitive operations (29) related to making the transactions secure,

characterised in that

- the number of times a request is made to the terminal to execute sensitive operations is counted (32, 16), and

- the action of this terminal is restricted as soon as this count reaches (33) a fixed value.

2. A method according to Claim 1, characterised in that

- the terminal is provided with a removable electronic security circuit (8), and

- the number of requests for sensitive operations which are made to it or sensitive operations executed by it are counted (16) in this circuit.

3. A method according to either of Claims 1 or 2, characterised in that

- the sensitive operations are divided into a number of classes and

- a count (16, 17) is set up for each class.

4. A method according to one of Claims 1 to 3, characterised in that,

- as a sensitive operation, a mutual identification procedure between the terminal and the card is executed.

5. A method according to one of Claims 1 to 4, characterised in that,

- as a sensitive operation, an authentication (PIN) of a carrier of the smart card is performed.

6. A method according to one of Claims 1 to 5, characterised in that,

- as a sensitive operation, a verification of a certificate coming from a smart card is performed.

7. A method according to one of Claims 1 to 6, characterised in that

- the counter is re-initialized by a secure procedure including a verification of a secret code by the terminal or the security circuit.

8. A method according to Claim 7, characterised in that

- the secure procedure includes a verification of a secret code by the terminal or the security circuit.

9. A method according to Claim 7, characterised in that

- the re-initialization is performed remotely by a master system.

10. A method according to one of Claims 1 to 9, characterised in that

- the counter is incremented after a successful sensitive operation.

11. A method according to one of Claims 1 to 10, characterised in that

- for restricting, only some (47) of the operations of the planned transaction are prevented.

12. A security circuit for implementing the method according to any one of Claims 1 to 11, characterised in that it has management means (16, 17, 32, 39) capable of:

- identifying and counting requests coming from outside and restricting its functions as soon as the count reaches a predetermined number.

ABSTRACT

The invention concerns a method solving security problems resulting from the addition of a security circuit to a smart card reading terminal by providing said security circuit with means for counting the number of times the security circuit is activated for certain sensitive operations. When the total of said operations reaches a fixed value, the security circuit is prevented from operating until it is re-initialized again. Optionally, the circuit may have to be replaced by another.

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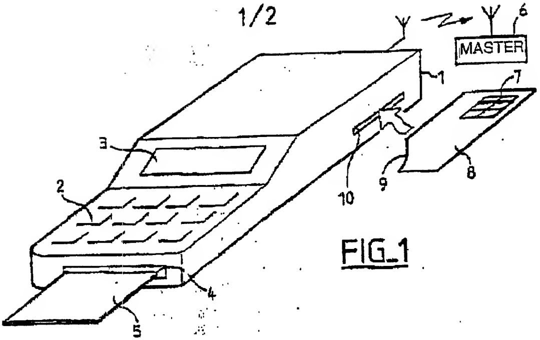

FIG_1

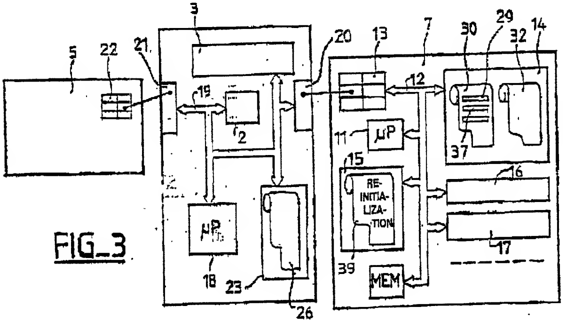

FIG_3

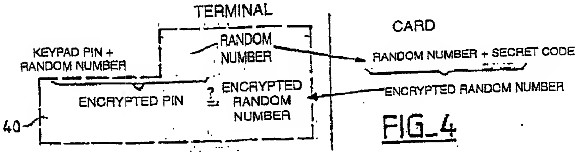

FIG_4

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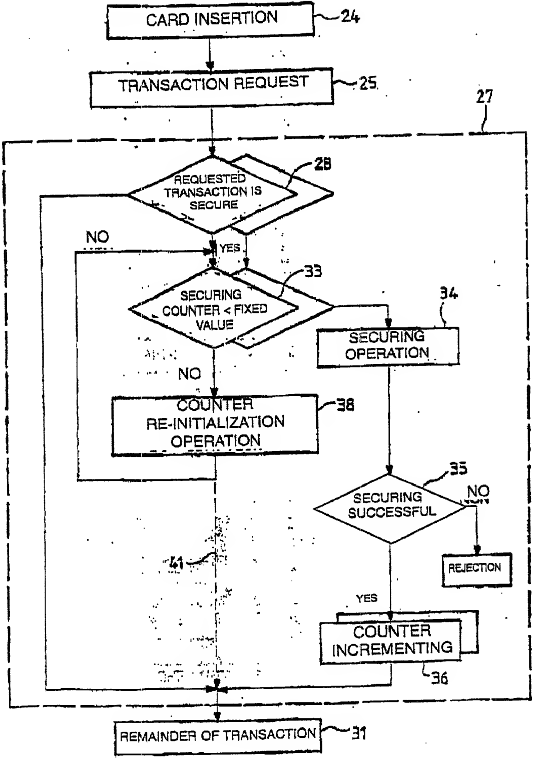
2/2

FIG_2



PATENT
Docket No. GEM-400

DECLARATION FOR UTILITY PATENT APPLICATION

AS THE BELOW-NAMED INVENTORS, I HEREBY DECLARE THAT:

Our residences, post office addresses, and citizenships are as stated below next to the inventor's name.

We believe we are the original, first and sole inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled: A METHOD OF MANAGING A SECURE TERMINAL, the specification of which is attached hereto unless the following box is checked:

☒ was filed on January 10, 2000 as United States Application Serial No. 09/462,925 and was amended on January 10, 2000.

WE HEREBY STATE THAT WE HAVE REVIEWED AND UNDERSTAND THE CONTENTS OF THE ABOVE-IDENTIFIED SPECIFICATION, INCLUDING THE CLAIMS, AS AMENDED BY ANY AMENDMENT REFERRED TO ABOVE.

We acknowledge the duty to disclose information which is material to the patentability as defined in 37 C.F.R. § 1.56.

We hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventors' certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States listed below and have also identified below, by checking the box, any foreign application for patent or inventors' certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Application No.	Country	Date of Filing (day/month/year)	Priority Claimed?
WO 99/03074	PCT	08/07/98	☒Yes ☐No
97/08813	France	10/07/97	☒Yes ☐No

We hereby claim benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

Application Serial No.	Filing Date
*	

We hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, we acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Application Serial No.	Filing Date	Status
*		□Patented □Pending □Abandoned

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1-00

22/5/00
Date

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